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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of | Atty. Docket

GAUTIER ET AL | FR00027

Serial No. 09/808,192 | Group Art Unit 2613

Filed: March 14, 2001 | Examiner Allen C. Wong

Title: VARIABLE BIT RATE VIDEO ENCODING METHOD AND DEVICE

Commissioner for Patents
BOX APPEAL BRIEF - PATENTS
Alexandria, VA 22313-1450

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On: Nov. 12, 2004

By: Elissa DeLucca

Sir:

Enclosed is an Appeal Brief in the above-identified patent application.

Please charge the fee of $340.00 to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Russell Gross, Reg. 40,007
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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On: Nov. 12, 2004

By: Elissa DeLucy

APPEAL BRIEF

Sir:

The rejection of Claims 1, 2, 5/2/1, 5/1/6 and 7 is hereby being appealed, which are reproduced in the attached Appendix.

1. Real Party in Interest

The real party in interest is Koninklijke Philips Electronics N.V., the assignee herein.

2. Related Appeals and Interferences

The Appellant is not aware of any appeals or interferences that relate to the present application.

3. Status of all Claims

Claims 1, 2, 5/2/1, 5/1/6 and 7 were submitted in the original application and are currently being appealed. Claims 3, 4, 5/4/3 and 5/3 stand currently allowed.

4. Status of Amendment

No Amendments were filed subsequent to the Final Rejection of June 28, 2004.

5. Summary of Claimed Subject Matter

The present invention is directed to a variable bitrate video encoding method including encoding a sequence of frames, at least a quantization step of an input bitstream, a coding step of said quantized bitstream, and a control step of the quantization step with respect to a buffer occupancy at the output of the coding step. AS shown in Figure 1, the method also includes an analysis step, for defining a reserve of bits (ROBC) indicating a number of bits used for coding each frame is either greater or less than a predetermined number, as described on pages 2-3 of the present application. Further, an additional control step,

for maintaining, increasing or decreasing the quantization step value according to the state of the reserve of bits, as described on page 3.

6. Issues To Be Reviewed on Appeal

Claim 1, 2, 5/2/1, 5/1/6 and 7 stands rejected under 35 USC 102(b) as being anticipated by Okada et al. (U.S. Patent No. 5,317,397).

8. Arguments

I. Claim 1, 2, 5/2/1, 5/1/6 and 7 Rejection

Claims 1, 2, 5/2/1, 5/1/6 and 7 stands rejected under 35 USC 102(b) as being anticipated by Okada et al. (U.S. Patent No. 5,317,397).

In order to make a proper rejection under 35 U.S.C. 102, Section 706.02 of The MPEP requires that a reference must teach every aspect of the claimed invention either explicitly or impliedly. Further, in order to establish anticipation, it is incumbent upon the Examiner to identify in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Mascinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, (Fed. Cir. 1984).

In view of the above, it is respectfully submitted that the burden of showing that Okada et al. anticipates all of the

features recited in Claim 1 has not been met. In particular, such features include "defining a reserve of bits (ROBC) indicating a number of bits used for coding each frame is either greater or less than a predetermined number".

In initially addressing this feature in the above rejection, column 23, lines 34-45, have been relied on. However, in column 23, lines 34-45, Okada et al. only disclosed:

"(I) When the ratios of the quantization step sizes Q·I, Q·P, and Q·B of the I, P1, P2 and B picture are set according to the following equation (3), high coding efficiency is ensured, and no deterioration in picture quality occurs:

$$Q \cdot I : Q \cdot P : Q \cdot B = 1 : aQ0 : aQ \qquad (3)$$

where aQ0 and aQ are constants. The ratio of the amounts of bits allocated to the respective pictures is updated such that the ratio of the quantization step sizes coincide with the ratio defined by equation (3)."

In view of the above disclosure, Okada et al. only discloses setting the ratios of the quantization step size according Equation 3. Thus, it is evident that Okada et al. does not disclose "defining a reserve of bits (ROBC) indicating a number of bits used for coding each frame is either greater or less than a predetermined number", as required by the claim. However despite this point, the above rejection was maintained.

In maintaining this rejection, column 23, lines 30-34, is additionally being relied on. However, in column 23, lines 30-

34, Okada et al. only discloses an amount of bits allocated to each picture is determined to satisfy to satisfy the above described conditions according with the following rules (I) and (II). Based on this disclosure, it is evident that neither this portion or the previous portion of Okada et al. discloses "defining a reserve of bits (ROBC) indicating a number of bits used for coding each frame is either greater or less than a predetermined number", as required by the claim. Therefore, it is respectfully submitted that this feature is not anticipated by Okada et al.

In view of the above-described distinctions, it is respectfully submitted that the invention of Claims 1, 2, 5/2/1, 5/1/6 and 7 is not anticipated by Pearlman et al. Therefore, the Appellant respectfully requests that the final rejection of this claim be reconsidered and reversed.

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Respectfully submitted,

By _____
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A P P E N D I X

1. A variable bitrate video encoding method comprising, for encoding a sequence of frames, at least a quantization step of an input bitstream, a coding step of said quantized bitstream, and a control step of the quantization step with respect to a buffer occupancy at the output of said coding step, said method being characterized in that it also comprises an analysis step, for defining a reserve of bits (ROBC) indicating a number of bits used for coding each frame is either greater or less than a predetermined number, and an additional control step, for maintaining, increasing or decreasing the quantization step value according to the state of said reserve of bits.

2. An encoding method according to claim 1, characterized in that the quantization stepvalue is modified only if said reserve of bits reaches critical values.

3. An encoding method comprising, for encoding a sequence of frames, at least a quantization step of an input bitstream, a coding step of said quantized bitstream, and a control step of the quantization step with respect to a buffer occupancy at the output of said coding step, said method being characterized in that it also comprises an analysis step, for defining on the basis of parameters related to said input bitstream a reserve of bits (ROBC) periodically updated at each frame, and an additional

control step, for maintaining, increasing or decreasing the quantization step value according to the state of said reserve of bits wherein evolution of an initial quantization step Q_INIT with respect to the state of the reserve (ROBC) is given by the following relations :

If (ROBC < 0) and (S1 < -ROBC/TFBB < S2)
then Q = Q_INIT + V1
If (ROBC < 0) and (S2 < -ROBC/TFBB < S3)
then Q = Q_INIT + V2
If (ROBC < 0) and (S3 < -ROBC/TFBB < S4)
then Q = Q_INIT + V3
If (ROBC < 0) and (S4 < -ROBC/TFBB < S5)
then Q = Q_INIT + V4
If (ROBC < 0) and (S5 < -ROBC/TFBB < S6)
then Q = Q_INIT + V5
If (ROBC < 0) and (S6 < -ROBC/TFBB < S7)
then Q = Q_INIT + V6
If (ROBC < 0) and (S7 < -ROBC/TFBB)
then Q = Q_INIT + V7
If (ROBC > 0) and (T1 < ROBC/TFBB)
then Q = Q_INIT - V8
Else ROBC = Q_INIT

where TFBB is total fixed bit budget, S1 to S7 are thresholds of increasing value, T1 is also a threshold, and V1 to V8 are the variations of said initial quantization step.

4. An encoding method according to claim 3, characterized in that said thresholds S1 to S7 are equal to (0,07 ; 0,15 ; 0,27 ; 0,4 ; 0,5 ; 0,6 ; 0,7) respectively, T1 is equal to (0,1) and said

variations V1 to V8 are respectively equal to 2, 4, 6, 8, 10, 12, 14 and 1.

5. An encoding device allowing to implement an encoding method according to anyone of claims 1 to 4.

6. An encoding method according to claim 1, wherein the predetermine number is an average number of bits to code each frame of the sequence.

7. An encoding method according to claim 1, wherein the analysis step includes finding a total bit budget for the sequence of frames and calculating the reserve of bits (ROBC) based on the total bit budget.